

have been canceled. In addition, Claim 1 has been amended in accordance with the description in the specification at the paragraph bridging pages 24 and 25 to recite that the wetting agent is present in amount which enhances a dispersion efficiency of the pigment. Claim 1 has also been amended in accordance with the disclosure at page 56, second full paragraph to recite the minimum amount of the dispersibility-providing group introduced onto the surface-treated pigment.

Claims 27-30 have been added more completely to define the subject matter which Applicants regard as their invention. Support for the recitations in Claims 27 and 28 appear in the specification as filed at page 50, second full paragraph, and page 52, second full paragraph, respectively.

Claim 7 has been amended to remove the basis for the rejection under 35 USC 112, second paragraph appearing at paragraph 3 of the Official Action. All claims presently on file are believed to be sufficiently definite to comply with the dictates of 35 USC 112, second paragraph.

Certain claims have been rejected under 35 USC 102(b) as allegedly being anticipated by Fujimatsu et al. taken in view of Ueda et al. Other claims have been rejected under 35 USC 103(a) as allegedly being unpatentable over Fujimatsu et al in view of one or more of Yatake et al, Osumi et al, or Ichizawa et al. Applicants respectfully traverse these rejections.

The claimed invention is based upon the Applicants surprising finding that, when preparing a pigment dispersion comprising a self-dispersible pigment, dispersion efficiency and dispersion stability of the pigment can be improved by use of a wetting agent and resin,

and by appropriate selection and use of the wetting agent during a step of dispersing the pigment in water. This is discussed in the specification in the paragraph bridging pages 24 and 25 of the specification and is shown in the Examples beginning on page 80, wherein it is shown that appropriate selection of the resin and wetting agent for dispersing a self-dispersible pigment results in pigment dispersions having advantageous characteristics, such as good fixability, gloss, ejectability and anti-clogging properties (see Table 1 on page 157 of the specification).

The Fujimatsu et al reference cannot be said, either alone or in combination with the other cited references, to show or suggest the claimed invention. For one thing, Fujimatsu et al do not show or suggest a self-dispersible pigment as claimed. Contrary to the Examiner's contention, it is respectfully submitted that the "acidic carbon black" described in Fujimatsu et al is not a surface-treated pigment, as defined on page 15, second full paragraph of the specification, that is self-dispersible in water. Moreover, the amount of the dispersibility-providing groups would not fall within the amount as now claimed.

The Examiner has relied on Ueda et al for the contention that Fujimatsu et al describes the claimed "surface-treated pigment", but it is respectfully submitted that such reliance is misplaced. Ueda et al discloses, in column 3, lines 25-30, general manufacturing methods of acidic carbon black. The products per se of these methods will not have self-dispersibility as required in the claimed invention. In fact, the acidic carbon black of Ueda et al is further subjected to oxidation treatment (see Ueda et al at column 3, lines 31-43).

In addition to the above, Applicants respectfully note that Fujimatsu do not disclose or suggest the claimed wetting agent or that the same be used in a dispersing step in an amount

that improves the dispersion efficiency of the claimed self-dispersible pigment. Accordingly, Fujimatsu et al, either alone or in combination with the other cited references, cannot be considered to set forth even a prima facie case of obviousness for the invention as now claimed in all claims.

Certain of the claims have been rejected under 35 USC 102(e) as allegedly being anticipated by Parazak. Other claims have been rejected under 35 USC 103(a) as allegedly being unpatentable over Parazak in view of Ichizawa et al or Johnson et al. Applicants respectfully traverse these rejections.

As discussed above, each of the claims presently on file is based on Applicants discovery that the use of an appropriate wetting agent and resin during the dispersion of a self-dispersible resin in water can provide for advantageous properties of the resulting dispersion. In accordance with this discovery, each of the claims provides for a dispersion step wherein the recited surface-treated pigment is admixed with the recited wetting agent to form a pigment dispersion. By contrast, Parazak teaches the preparation of an ink, not a pigment dispersion, and does not show or suggest the admixture of a wetting agent with a surface-treated pigment during the formation of a pigment dispersion.

In this respect, Applicants respectfully note that, in the Parazak Examples, a commercial product (Cab-O-Jet brand dispersion available from Cabot Corp.) is used. This product is a pigment dispersion that is prepared without either a resin or a wetting agent (see attached product information sheets provided by Cabot Corp.). This being the case, the cited example 1 of the reference cannot be considered to show or suggest the claim recitation of admixing the recited wetting agent and surface treated pigment during (as opposed, for

example, to after) the dispersion step in an amount sufficient to enhance the dispersion efficiency, as claimed. Moreover, the example does not show or suggest the recitations in claims 27 or 28 relating to the respective amounts of the wetting agent and pigment present in or after the claimed dispersing step. (Note: although the Examiner has contended that the ratio of acetylene glycol to pigment is 1/20 in Parazak example 1, this is respectfully believed to be the ratio of acetylene glycol to pigment dispersion, not pigment.)

There is nothing in either of the secondary references that could cure the defect in the primary reference and, accordingly, the references are respectfully believed to be incompetent to set forth even a prima facie case of obviousness for the invention now claimed.

Certain claims have been rejected under 35 USC 103(a) as allegedly being unpatentable over Satake et al in view of one or more of Osumi et al, Ichizawa et al, Johnson et al and Yatake et al. Applicants respectfully traverse these rejections.

The Examiner has acknowledged that Satake et al does not show or suggest the claimed surface treated pigment or the claimed wetting agent, but contends that it would have been obvious from Osumi to use the surface treated pigment and the acetylene glycol surfactant described therein in the Satake et al method. Applicants respectfully disagree and note that the combination of Satake et al with Osumi would not arrive at the claimed invention.

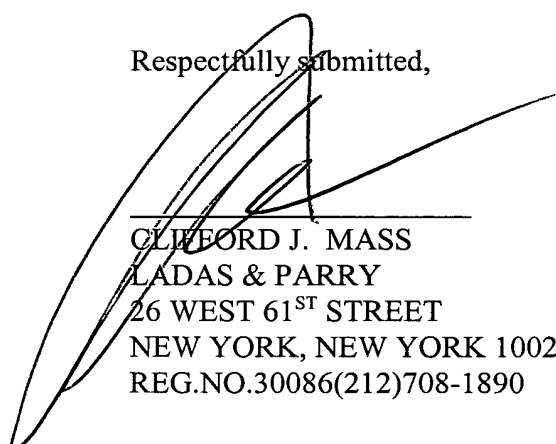
As discussed above, the claimed invention requires that the claimed surface treated pigment and the claimed wetting agent be admixed during the dispersing step in the preparation of the claimed dispersion so as to improve the dispersion efficiency. By contrast,

as can be seen by the Examples in Osumi et al, the acetylene glycol surfactant is added therein after the pigment dispersion has already been prepared. Accordingly, the combination of references does not show or suggest this claim recitation. Moreover, the combination of references does not show or suggest the recitations in claims 27 or 28 either.

None of the other references cited by the Examiner can supplement the aforementioned deficiencies in the above references such that none of the cited combinations could arrive at the invention as now claimed. Accordingly, cited references are not believed to set forth even a prima facie case of obviousness for the claimed invention.

In view of the above, all rejections and objections of record are believed to have been successfully traversed and the application is now believed to be in allowable form. An early notice of allowability is earnestly solicited and is believed to be fully warranted.

Respectfully submitted,



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1. (Amended) A process for the preparation of a pigment dispersion which comprises (a) a pigment surface treatment step of introducing at least one hydrophilic dispersibility-providing group onto the surface of a pigment directly and/or with the interposition of a polyvalent group to form a surface-treated pigment that is self-dispersible in water and that comprises said at least one hydrophilic dispersibility-providing group in an amount of not lower than 10×10^{-6} equivalent per gram of particulate pigment, [and] (b) a dispersion step of dispersing a surface-treated pigment obtained at said surface treatment step in an aqueous medium, wherein said dispersion step involves the dispersion of said surface-treated pigment in admixture with a wetting agent and water wherein the wetting agent is selected from the group consisting of acetylene glycols, acetylene alcohols, glycol ethers and alkylene glycols; and is present in an amount that enhances a dispersion efficiency of particles of the surface-treated pigment in water, (c) adding a resin for providing dispersibility and/or fixability [is added] during and/or after said dispersion step to form said pigment dispersion, wherein the pigment dispersion has a liquid component comprising polyvalent metal ions in a total amount of not more than 600 ppm.

7. (Amended) The process for the preparation of a pigment dispersion according to Claim 1, wherein said hydrophilic dispersibility-providing group to be introduced onto the surface of a pigment at said surface treatment step comprises at least one selected from the group consisting of functional groups represented by the following general formulae and salts thereof:

-OM, -COOM, -CO, -SO₃M, -SO₂M, -SO₂M, -SO₂NH₂ -
RSO₂M, -PO₃HM, -PO₃M₂,
-SO₂NHCOR, -NH₃, and -NR₃ in which M represents a

hydrogen atom, alkaline metal, ammonium or organic ammonium; and R represents a C₁₋₁₂ alkyl group, a phenyl group which may have a substituent or a naphthyl group which may have a substituent.